

BILLY CLAY, DVM, Volume II, 3-25-09

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1 IN THE UNITED STATES DISTRICT COURT FOR THE
2 NORTHERN DISTRICT OF OKLAHOMA
3
4

5 W. A. DREW EDMONDSON, in his)
6 capacity as ATTORNEY GENERAL)
7 OF THE STATE OF OKLAHOMA and)
8 OKLAHOMA SECRETARY OF THE)
9 ENVIRONMENT C. MILES TOLBERT,)
10 in his capacity as the)
11 TRUSTEE FOR NATURAL RESOURCES)
12 FOR THE STATE OF OKLAHOMA,)

13 Plaintiff,)
14)

15 vs.)

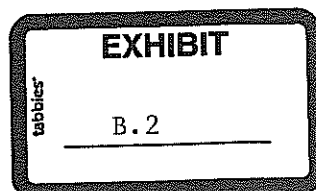
4:05-CV-00329-TCK-SAJ

16 TYSON FOODS, INC., et al,)
17)

18 Defendants.)
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24
25

26 VOLUME II OF THE VIDEOTAPED
27 DEPOSITION OF BILLY CLAY, PhD, produced as a
28 witness on behalf of the Plaintiff in the above
29 styled and numbered cause, taken on the 25th day of
30 March, 2009, in the City of Tulsa, County of Tulsa,
31 State of Oklahoma, before me, Lisa A. Steinmeyer, a
32 Certified Shorthand Reporter, duly certified under
33 and by virtue of the laws of the State of Oklahoma.

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1 indicated that the cattle in those subwatersheds all
2 have access to the riparian areas or streams?

3 A Yes.

4 Q Can you tell me where that is in that report?

5 A Page 87. 08:38AM

6 Q Okay. Tell us where it is you're talking
7 about.

8 A The upper paragraph where it says, cattle
9 process nutrients through grass into a more readily
10 available form of algae, compounding the problem. 08:38AM

11 Given direct access to water, cattle frequent the
12 riparian areas, as on hot days these areas provide
13 the most shade. Thus, cattle act mostly almost as a
14 point source depositing nutrients directly into the
15 stream. 08:38AM

16 Q Okay. Where does it say in that statement
17 that all cattle have access to streams in the
18 watershed that you have used as your assumption in
19 order to calculate -- make your calculations?

20 A It says cattle has access to the streams. 08:38AM

21 Q Okay. So you assume from that that means all
22 cattle in all watersheds in the IRW?

23 A It would be similar to many of these articles
24 you provided me with a one sentence.

25 Q That's not my question to you, sir. Is it 08:39AM

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1 on that.

2 Q Okay.

3 A It's Dr. Jobes.

4 Q Dr. Jobes, thank you. Let's just talk about
5 him real quick while we're there. Is he employed at 08:46AM
6 this time?

7 A He's an emeritus faculty at Oklahoma State
8 University.

9 Q How long have -- is this the first time you
10 worked with him in preparing a paper or a report as 08:46AM
11 you've done here?

12 A Yes, it is.

13 Q What's his education?

14 A He has a PhD in agricultural economics.

15 Q Who pays him for the work he's done? 08:46AM

16 A Well, the -- in this case the defendants.

17 Q Is it Ozark International that's paying him?

18 A Yes.

19 Q You're not paying him from your expenses?

20 A No. 08:47AM

21 Q All right. How was it you came to use Dr.
22 Jobes?

23 A Well, I've known Dr. Jobes for a while. We
24 live in the same section of land for that matter,
25 and I know he's an agricultural economist, and I 08:47AM

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1 know he's done many of these kinds of things for
2 Oklahoma State University. So I sought him out and
3 asked him if he would be interested.

4 Q All right. Have you worked with him on any
5 other projects besides the one to prepare your 08:47AM
6 expert report?

7 A Yes.

8 Q What kind of projects have you worked with him
9 on?

10 A We worked on a dairy project. It was a 08:47AM
11 essentially a dairy economics project, but it had to
12 do with disease status of the animals as well, and I
13 worked on the disease status and he worked on the
14 economics.

15 Q Did he write any of the report that's 08:47AM
16 presented under your name in this expert report?

17 A No.

18 Q Did he prepare most of the appendices or all
19 of the appendices that are attached to your report?

20 A Yes. 08:48AM

21 Q Is the Poultry Waste Management Handbook an
22 authority relied on by the scientific community for
23 purposes of determining waste characteristics with
24 poultry?

25 A It's one of them. 08:48AM

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1 MR. GRAVES: Object to form, lack of
2 foundation.

3 Q Let's look, if you would, briefly again at
4 Exhibit 8, sir.

5 A Well, if I can find it. I must have 08:50AM
6 overlooked it.

7 Q It's the ASAE standard.

8 A I know what it is and, in fact, I recognize it
9 when I see it but when I went through it --

10 Q There it is. 08:50AM

11 A I went right past it.

12 Q All right. When we -- I think we talked about
13 this a little bit yesterday, but I want to clear up
14 something on Table 2 at Page 718 when you look at
15 fresh manure production and characteristics for a 08:50AM
16 thousand live animal mass per day at that table.

17 A Yes, sir.

18 Q Are you there?

19 A Yes.

20 Q All right. Your calculations rely on not a 08:50AM
21 thousand pound live animal but, as you said
22 yesterday, 1,300 pounds for beef; correct?

23 A No.

24 Q Okay.

25 A 1,300 pounds represents 1.3 animal units 08:50AM

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1 converted to live animal or to a thousand pounds.

2 All of it is converted to a thousand pounds after I
3 created the unit.

4 Q So all your calculations go from the 1,300 to
5 a thousand pound?

08:51AM

6 A Correct.

7 Q So you take 30 percent increase out of it in
8 order to make your comparisons?

9 A No. To standardize it, to make it thousand
10 pound units.

08:51AM

11 Q All right. All right. We'll get -- we'll
12 move into those later. So with regard to the total
13 manure, though, as we see the dairy and beef, the
14 dairy -- this is a manure production, is it not, as
15 opposed to -- well, it doesn't include litter; it's
16 just manure production, correct, on this table?

08:51AM

17 A Yes. That's what it says, total manure, mean.

18 Q Beef, you said, is the dominant animal for
19 cattle in the watershed?

20 A Correct.

08:51AM

21 Q And the broilers are the dominant bird that is
22 produced in the watershed?

23 A Correct.

24 Q All right, and did you use this as a reference
25 for source of manure production in your

08:52AM

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1 that you said was your source for the size of birds?

2 A Yes.

3 Q All right. That doesn't say 5.13 on it,
4 though, does it?

5 A Well, that was just from recall. 09:02AM

6 Q Now, in order to get to the number of birds
7 that you calculated are in the IRW, you relied on
8 the census through the ZIP Code dataset; is that
9 correct?

10 A Yes. 09:03AM

11 Q And you downloaded that dataset or did Mr. --
12 Dr. Jobes download that dataset?

13 A Dr. Jobes did.

14 Q All right, and he made the calculations from
15 that -- let me ask it this way: Who made the 09:03AM
16 calculations to assign what percentage of each ZIP
17 Code would be in the IRW?

18 A He did that.

19 Q What assumptions did he make in the
20 allocation, if you will, of the birds within the ZIP 09:03AM
21 Code?

22 A Well, they're reported in the ZIP Code.

23 Q I'm sorry. I didn't make my question very
24 clear. In talking about those that lie in and
25 outside of the boundaries of the IRW -- 09:04AM

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1 A Oh.

2 Q -- what assumptions and allocations did he
3 make to calculate the birds?

4 A When we ordered the ZIP Code data, they sent
5 it in hard copy form, as well as by E-mail. 09:04AM
6 told us what percentage of the ZIP Code was in the
7 county of each of the ZIP Codes that were involved.
8 We then did an overlay over the watershed and
9 determined what percentage of the ZIP Code was in
10 the watershed. 09:04AM

11 Q And how was that overlay done?

12 A It was done with a computer.

13 Q And who did that?

14 A He did that.

15 Q And do you know what he used in order to make 09:04AM
16 the overlay?

17 A I don't remember.

18 Q Did you see him do the work?

19 A I saw it after he had it in place.

20 Q Do you agree that the census provides some 09:04AM
21 confidentiality in the reporting of data that it
22 collects for the farmers?

23 A Yes, I do.

24 Q Let me hand you what is marked as Exhibit No.

25 9. Have you seen that before on the Ag Census 09:05AM

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1 determine a margin of error for the estimates made
2 from the calculations for the number of poultry
3 being produced?

4 A No.

5 Q Let me hand you what's Exhibit 38 and ask you 09:07AM
6 if you recall seeing that document.

7 A Yes. It looks familiar.

8 Q That's, in fact, Table BA from your
9 appendices, is it not?

10 A Yes. 09:07AM

11 Q All right. Do you see where circles have been
12 entered on the lower portion of this document?

13 A Yes.

14 Q And do you see where they have circled some
15 asterisks that appear there? 09:07AM

16 A Yes.

17 Q And do you agree with me, sir, that based on
18 the prior exhibit, this is ZIP Codes listed that
19 have no data based upon the fact there's one to four
20 farms in that ZIP Code? 09:08AM

21 A I am.

22 Q Is that your understanding of why that's
23 there?

24 A It is.

25 Q All right, and you're saying that Dr. Jobes 09:08AM

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1 did not make any adjustment for those; correct?

2 A No. We were aware that there was an under
3 estimate on turkeys.

4 Q All right, and did you contact the integrator
5 that produces turkeys in this case to determine how 09:08AM
6 many turkeys they produce in the IRW?

7 A We didn't.

8 Q All right. Looking at -- I believe there's a
9 ZIP Code -- at the very last page the ZIP Code in
10 Delaware County is 74964. It would be the very last 09:08AM
11 page, almost to the middle of the --

12 A Yes.

13 Q Do you see where the two circles are shown
14 there, one for a broiler and one for turkeys sold?

15 A I do, I do. 09:08AM

16 Q So that would indicate no disclosure or no
17 data provided for broilers or turkeys in that ZIP
18 Code; correct?

19 A That's correct, because there was just I think
20 two. I think there were two. 09:09AM

21 Q Did -- what -- you say you think there were
22 two. Two what?

23 A Two farms.

24 Q And did you do anything to validate or confirm
25 what you thought was true or not true? 09:09AM

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1 A No. We knew that there would be some under
2 estimate in a few places, but we were looking at a
3 gross estimate to begin with.

4 Q If you could find Exhibit 17 and we'll just
5 look at that real quick and leave that handy I 09:09AM
6 guess.

7 A 17?

8 Q Yes, sir. That's going to be the discovery
9 materials showing the bird numbers with the summary
10 page on the front. 09:09AM

11 A I hope I didn't go past it again.

12 Q It's a rather thick one.

13 A Okay. I see it.

14 Q Look under the column of 2002, and can you
15 tell me which integrator produces turkeys in the 09:10AM
16 watershed?

17 A Well, Cargill produces some turkeys.

18 Q Okay, and what is the number of birds produced
19 in 2002 by Cargill?

20 A They say 2.8 million. 09:10AM

21 Q And do you recall how many birds, turkeys you
22 used in your calculations for turkeys being
23 produced?

24 A Yes.

25 Q What was it? 09:10AM

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1 A 669,000.

2 Q Okay. That's about 2.2 dollar -- 2 million
3 birds -- 2.2 millions birds short of what they say;
4 correct?

5 A Correct. 09:10AM

6 Q Let's look at Exhibit 40, a 2002 Ag Census
7 form. Have you seen these documents before or this
8 particular document?

9 A I've looked at it, yes.

10 Q Okay. Unfortunately, we don't have page 09:11AM
11 numbers. I'll have to refer you to Section 9, which
12 deals with hogs and pigs.

13 A Section -- okay.

14 Q Well, actually let's go to Section 10. We'll
15 start with the cattle. It's the next page over. 09:11AM
16 Now, can you tell the court what this form is used
17 for?

18 A It's a census form for individual producers to
19 fill out.

20 Q And is this the form that ends up in the Ag 09:12AM
21 Census data that you used in preparing your
22 calculations in this case?

23 A Correct.

24 Q Under 1A of this form, it talks about beef
25 cows. 09:12AM

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1 A Yes.

2 Q And it says include beef heifers that had
3 calved; correct?

4 A Which in essence is cows.

5 Q Okay, and then under 1C it talks about other 09:12AM
6 cattle, which are heifers, steers, calves and bulls
7 combined; isn't that true?

8 A Yes.

9 Q All right. Doesn't that cover all of the
10 cattle that would exist in a given period for 09:12AM
11 purposes of a census?

12 A That exist, yes.

13 Q All right, and can you tell the court why it
14 is then you added a bull in your calculations and
15 additional heifer replacements in your use of the 09:12AM
16 1.3 animal unit calculation?

17 A To produce the manure and the total amount of
18 material that's within the manure.

19 Q You didn't rely then on just the census, did
20 you? 09:13AM

21 A I told you from the beginning I relied on the
22 census, plus the data that's available to support
23 that.

24 Q Wouldn't you agree with me, sir, the
25 definitions for the type of beef cow and other 09:13AM

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1 cattles that are listed here would include heifers
2 whether they're replacements or not?

3 A Yes, but if you'll look closely at our
4 calculations, what we did in determining or using
5 those -- that 1.3, we didn't put the calves in 09:13AM
6 there. We put the heifers in there but no calves
7 were included. Now, what you have in other cattle,
8 although it's not spelled out here, is that there
9 are a lot of cattle that are bought and sold in the
10 watershed. There are also a lot of cattle -- calves 09:13AM
11 that are carried over from one year to the next to
12 grow them.

13 Q And aren't those all intended to be picked up
14 in the census by the definition of the beef cows and
15 other cattles? 09:14AM

16 A And that's what the producer does. They just
17 count all of those cattle, add them up and put them
18 in there.

19 Q All right. So you would have them all in
20 those counts, would you not? 09:14AM

21 A That's right. They'll all be in there in
22 other cattle.

23 Q And notwithstanding that, you still added more
24 to it in order to do your numbers, didn't you?

25 A Did not add more to it. 09:14AM

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1 Q Well, you used a 1.3 versus a 1, didn't you.
2 Doesn't that additional .3 include part of a bull,
3 additional heifers that are being --

4 A 1-25th of a bull.

5 Q Okay, and it includes replacement heifers, 09:14AM
6 doesn't it?

7 A Heifers but no calves.

8 Q All right, but all the heifers are supposed to
9 be accounted for by this document; don't you agree?

10 A As far as the production of manure and/or its 09:14AM
11 constituents, the difference between the heifers
12 that would be included in the 1.3 and the calves is
13 a wash because the calves, there are about 81,000 of
14 them or could be 81,000 of them, which were not
15 accounted when we were doing that, and the heifers 09:14AM
16 are two heifers per eight cows.

17 Q Where did you get your calf number that you
18 just referred to?

19 A Calf crop.

20 Q And where did -- calf crop? 09:15AM

21 A About 80 percent calf crop.

22 Q And that's an estimate on your part; correct?

23 A That's an estimate.

24 Q It's not coming from the Ag Census?

25 A No. 09:15AM

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1 A 145 million.

2 Q And what were the total birds used for your
3 calculations?

4 A 151 million.

5 Q Do you have an explanation as to why it 09:20AM
6 appears that you've under counted them and that
7 integrator bird numbers are even lower than yours?

8 A The integrator birds, in each case where they
9 submitted these numbers, they said they don't keep
10 that kind of information by year and that they would 09:21AM
11 have to make an estimate. So they made those
12 estimates, and their estimate is 145 million. My
13 estimate is 150 million, and Miss Smith's estimate
14 is 151 million.

15 Q And it appears, based upon your methodology, 09:21AM
16 you've missed several million birds in just one ZIP
17 Code; agreed?

18 A Apparently I did and Miss Smith did as well.
19 That's Alexander Smith.

20 MR. ELROD: Meagan Smith. 09:21AM

21 A Meagan Smith.

22 Q What is the basis for your number of 49 days
23 for a flock in the IRW?

24 A That also came out of the similar kinds of
25 references as I had from that book, Delmarva 09:21AM

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1 appendices that you used in some circumstances, such
2 as the first page, C2. Do you recognize that as a
3 table that was in your appendices?

4 A It looks like it, yes.

5 Q Okay. Under the column animal weight, you 09:24AM
6 have a replacement heifer for one year with an
7 eight-year adjustment for weight and you have that
8 at 925 pounds. Is that the way I see that or
9 understand that? Are you with me?

10 A Where are you? 09:24AM

11 Q Maybe I've got the wrong exhibit here. I'm
12 looking at Table C2.

13 A Oh. No, this is not C2. Wait just a minute.
14 Maybe C2 is included here. Yeah, okay, all right.

15 Q Are you there? 09:25AM

16 A All right. Okay. Now your question was?

17 Q Yeah. I had one that's blown up. That's why
18 it's a mess. Tell me how you got the calculation
19 for the 925-pound replacement heifer.

20 A Well, in replacing a heifer or replacing a cow 09:25AM
21 every eight years, you actually need two heifers on
22 the ground, and first one you keep for the first
23 year is 600 pounds and by the second year they're
24 925 pounds.

25 Q So why are you using replacement heifers here 09:25AM

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1 if you're trying to look at a time shot window, if
2 you will, of what's going on in the watershed? I
3 understood you to say yesterday you were trying to
4 take a moment in time, my word, not yours, about the
5 animals that are there. Why are you inserting an 09:26AM
6 eight-year replacement number in this?

7 A Because that's what would be there.

8 Q It's going to be there every year?

9 A Yes.

10 Q And tell me again why it's there every year if 09:26AM
11 it's a replacement heifer.

12 A Well, because the cow lives for eight years.
13 She produces six calves, and so she has to be two
14 years old before she produces her calf. So you have
15 to raise her to that point and breed her and then 09:26AM
16 have her to produce. So in order to fulfill that,
17 you have to have two heifers in the line to get them
18 to fulfill those replacements.

19 Q And aren't those heifers counted in the census
20 when we looked at the definition of what is supposed 09:26AM
21 to be put in the census?

22 A And I explained to you earlier that, yes, we
23 knew that, but because we didn't include any of the
24 calves, we considered that there was a wash between
25 the manure and nutrients in the heifers versus the 09:26AM

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1 no calves included.

2 Q How do you exclude the calves when they're
3 part of a number that has a grouping of various beef
4 animals in one number?

5 A We excluded the calves because the calf crop 09:27AM
6 is based and the census is based on January, and
7 January is after the producer has sold the bulk of
8 their calf crop. They sell them in the fall, and
9 they're born in the early spring, late winter to
10 early spring, and they keep them on the property 09:27AM
11 about eight months and then they sell them, and
12 that's the way they make their money.

13 Q And so your testimony then is that based upon
14 that process, these calves are never counted in the
15 Ag Census? 09:27AM

16 A Those calves would not be counted in the Ag
17 Census, the ones that are sold. Now, if you go to
18 cattle sold, they may appear there, but we didn't
19 use that number.

20 Q Okay, all right. So the census reflects them 09:27AM
21 perhaps under a different category is what you're
22 saying?

23 A Correct.

24 Q And you ignored that category?

25 A We weren't using it in this case because we 09:28AM

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1 wanted to include the heifers as a unit as a part of
2 the cow.

3 Q And why wouldn't you just go ahead and pick up
4 the calves from the calves sold?

5 A We could have done it that way. We didn't 09:28AM
6 choose to do it that way.

7 Q Did you make that calculation?

8 A I don't believe we did.

9 Q So you don't know whether it's a greater or
10 lesser amount if you had done it that way, do you? 09:28AM

11 A Well, you take 800,000 calves versus a
12 fraction of number of heifers. You know, it's a
13 pretty good trade-off.

14 Q You didn't do the calculation to determine
15 what their resale would be? 09:28AM

16 A Oh, I think we did it on just a hand rough
17 calculation. Dr. Jobes did.

18 Q Looking at the -- the line item below this one
19 where it says replacement heifers, six months at 600
20 pounds? 09:28AM

21 A Yes, yes, yes.

22 Q Okay. Is that a weaned weight?

23 A Yes, approximately.

24 Q Okay. What is the type of breed of cattle you
25 are using to calculate these weights? 09:29AM

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1 A These are mixed breeds.

2 Q And those are?

3 A Well, there are multiple breeds in the
4 watershed, both Arkansas and Oklahoma. The
5 preferred type of cattle is cross bred cattle 09:29AM
6 because of the heterosis that's involved there,
7 meaning hybrid vigor that's involved there. So
8 you're going to have a lot of English breed base
9 cattle that are also crossed on to Continental
10 cattle. 09:29AM

11 Q Looking at I think it's Table AA, it shows
12 here that you've used inventory numbers for the
13 animals on this page. Tell us why you used
14 inventory numbers when many or a lot of those are
15 sold basically in a six-month period. 09:30AM

16 A Exactly where are you now?

17 Q I'm on Table AA where you're listing at the
18 top beef cow down through horses and ponies.

19 A Oh, okay. I'm sorry.

20 Q And you're using inventory number; correct? 09:31AM

21 A Depending on the animal and the focus, yes.

22 Q And are not some of those sold during the
23 year, too?

24 A Yeah, some could be sold during the year.

25 Q Did you make any calculation to reflect the 09:31AM

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1 sale of some of those?

2 A I don't think we did, but there -- there's not
3 very many sold on a relative basis because they're
4 trying to maintain those -- those base herds that's
5 involved. In other words, when you replace the
6 animal, you replace it in the case of cattle with
7 the heifers.

09:31AM

8 Q Look quickly at I guess C1, the large -- and
9 under the heading where you talk about the broilers,
10 you show that you use the 2.25 for the weight;
11 correct?

09:32AM

12 A Yes.

13 Q And five turns at 49 days?

14 A Yes.

15 Q Why did you use five turns at 49 days?

09:32AM

16 A We saw that used routinely in State documents.

17 Q What State documents did you look at that told
18 you that?

19 A Well, the basin management document was one of
20 them.

09:32AM

21 Q Anything else?

22 A Well, there were several of them. I just
23 can't remember all of them.

24 Q Okay. Have you heard that it's not uncommon
25 to turn flocks as many as six times?

09:32AM

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1 A And -- yes, and the drying process that goes
2 on there, and also as mentioned earlier, there is
3 some degree of decomposition that goes on there, and
4 in that decomposition, there's nitrogen loss and
5 there's carbon dioxide loss.

09:54AM

6 Q Aren't those things taken into consideration
7 in the Ag Waste Management Handbook when they show
8 the characteristics for poultry litter?

9 A Yes.

10 Q Okay. So my question to you is, why would you
11 change those numbers for calculations in this
12 lawsuit instead of use what they had published?

09:54AM

13 A We were just looking at it. As you will see,
14 we didn't absolutely use those numbers anywhere in
15 our total calculations. What we did is just lay it
16 out and looking at it from our perspective to look
17 at. What we looked at was we actually reduced the
18 manure itself to its absolute dry weight and then
19 added back the given amount of moisture, as well as
20 the amount of -- given amount of organic material,
21 to arrive at that calculation.

09:54AM

09:54AM

22 Q And that calculation isn't the same that's
23 published in the Ag Waste Management Handbook, is
24 it?

25 A That calculation isn't the same.

09:55AM

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1 Q When you took the manure and then you added
2 back essentially the litter and the moisture
3 content, didn't you?

4 A Yes.

5 Q That's essentially what you're doing? 09:55AM

6 A Yes.

7 Q Well, my point is, that calculation isn't the
8 same as is published by the Ag Waste Management
9 Handbook?

10 A It's similar. 09:55AM

11 Q But it's not the same, is it?

12 A It's not absolutely the same, but all of these
13 are estimates, just like all of the estimates that
14 were provided by your consultants.

15 Q Did -- did the calculation that you performed 09:55AM
16 show that there is a greater or lesser amount of
17 poultry manure being moved out of the house?

18 A It showed that it's -- from all of those
19 people that have made calculations that were
20 available to me, it showed that I'm kind of right in 09:55AM
21 the middle of those calculations.

22 Q As compared to the Ag Waste Management
23 Handbook, does it show -- do your calculations show
24 that --

25 A Mine are similar. Mine numbers are similar. 09:55AM

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1 Q I haven't finished the question.

2 A Oh, I'm sorry.

3 MR. TUCKER: Remember, you have to count to
4 two.

5 A Yes. 09:56AM

6 MR. ELROD: You need to count to three.

7 Q Do your calculations -- when you have dried
8 the manure, added back the litter and then it's
9 removed at that time, that number is greater than or
10 lesser than what would be published in the Ag Waste 09:56AM
11 Management Handbook?

12 A It's similar. I can't remember the exact
13 comparison.

14 Q Isn't it a fact it's less, sir?

15 A It might be slightly less. 09:56AM

16 Q Do you know?

17 A I can't remember it to be frank with you, but
18 I have several estimates of litter production, and
19 that's what they all are. They're all estimates.
20 My estimate is different from some of the others but 09:56AM
21 quite similar.

22 Q But you went and did some additional
23 calculations in order to come up with your number
24 when in fact the as-is or as-removed litter numbers
25 are published in a waste management handbook that 09:57AM

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1 has been adopted and accepted and utilized by
2 experts in this field for years; do you agree with
3 that?

4 A I agree that there are -- the waste management
5 handbook is -- what year is it -- '92. I agree that 09:57AM
6 those numbers are there. I could also tell you that
7 no one had the numbers to calculate the amount of
8 litter in the Illinois River watershed. We chose a
9 method of doing that whereby we did it based on 2002
10 census data so that we could estimate a number of 09:57AM
11 total poultry in the watershed and from that total
12 poultry determine how much manure they're likely to
13 produce and then convert that to a litter format.

14 Q And given the choice in this case when you
15 redid these calculations from what's shown in the Ag 09:57AM
16 Waste Management Handbook, you had a choice, didn't
17 you, to use your calculations, which are lower than
18 those that are published in the Ag Handbook;
19 correct?

20 A Actually, I had a choice to take an average of 09:58AM
21 the lowest estimate and an average of the highest
22 estimate. That was a choice. I preferred to take
23 the -- use the choice of my own production data.

24 Q And the production data is from your
25 methodology of calculating ZIP Code from the Ag 09:58AM

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1 Census in determining the amount of birds; correct?

2 MR. GRAVES: Object to the form.

3 A That is correct.

4 Q Let me hand you what's been marked as Exhibit

5 45. Do you recognize this page from your 09:59AM
6 appendices?

7 A Yes.

8 Q And the page that references is A-S1 Page 5?

9 A Yes.

10 Q With a date 1-26-09 on it; correct? 09:59AM

11 A Correct.

12 Q Is this a page where calculations were
13 corrected and recently provided to us?

14 A I believe that's true.

15 Q Let's just start at the top and work our way 09:59AM
16 down through this. It says at the very top, this is
17 a procedure for converting poultry manure from
18 as-produced to litter available for application in
19 the IRW.

20 A Correct. 10:00AM

21 Q When you're saying from as-produced, what do
22 you mean by that term?

23 A The manure as it comes out of the back of the
24 bird, converting it to litter.

25 Q All right, and this is the process that we 10:00AM

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1 just talked about where you take simply the manure?

2 A Yes.

3 Q Dry it independently in your calculation?

4 A Correct.

5 Q Add back litter based upon an estimate of what 10:00AM
6 you believe is in the barn; correct?

7 A Correct.

8 Q And then reduce that again by another some
9 additional moisture content reduction; correct?

10 A Correct. 10:00AM

11 Q Now, did you validate your calculations on the
12 total amount of litter that has been removed from
13 the house as compared to what Sheri Herron told you
14 is normally removed?

15 A Well, I made comparisons, yes. 10:01AM

16 Q And did you get 190 tons in your calculations
17 when you did that?

18 A Well, I think I reported that in my report.

19 Q Do your calculations show that it's 190 tons
20 being removed after you dried it twice? 10:01AM

21 A No. It's not a matter of 190 tons per house.
22 This is not based on a house. This is based on
23 total number of poultry.

24 Q And how many average poultry are in a house on
25 a flock? 10:01AM

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1 A Well, I didn't do it that way. I just took
2 the total poultry to make the calculations.

3 Q So you -- back to my initial question then,
4 you didn't verify or validate your calculations
5 against another known number like Sheri Herron, who 10:01AM
6 knows how much litter is actually pulled out in
7 tons?

8 A Yes, I did.

9 Q And where can you show me you did that?

10 A Just a moment. Excuse me. It will take me a 10:02AM
11 moment to find it.

12 Q Are you referencing your report?

13 A Yes. Page 17 of the report. I show a Herron
14 number using that 190 tons and 1,800 houses of
15 307,700 tons, and my number was 295,114, and then I 10:02AM
16 did a calculation based on litter produced from the
17 handbook, poultry handbook, and calculated 312,000
18 tons, and so that was a comparator way, a way of
19 comparing.

20 Q So the number you have here for Herron/Clay, 10:03AM
21 you're telling me that's 190 tons times 1,800
22 houses?

23 A Yes.

24 Q Back again to the large spreadsheet that we're
25 on in Exhibit 45. 10:03AM

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1 A Okay.

2 Q Under the column that says as-produced, is
3 that wet manure only?

4 A Yes.

5 Q Dry basis, what is the -- what is it we're 10:03AM
6 talking about in the column dry basis?

7 A Total solids.

8 Q All right, and that's manure only?

9 A Yes.

10 Q And the reduction from composting, is this the 10:04AM
11 calculation you're making of the manure only without
12 litter?

13 A Well, yes. The losses that occur in the house
14 before it's harvested.

15 Q Okay, and that's in addition to what's 10:04AM
16 reported in the waste -- Ag Waste Management
17 Handbook, correct; this is that additional
18 calculation we talked about earlier?

19 A Well, it uses some of that data to calculate
20 it, yes. 10:04AM

21 Q Well, this is just reducing and you say by
22 composting the manure only; correct?

23 A Yes. It's got -- certainly from the practical
24 point of view, there's litter there. I mean,
25 there's organic material there, but from the 10:04AM

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1 practical point of view, just at looking at the
2 manure because that's what's -- that's what's losing
3 the components while it's in the house.

4 Q And then the next column is entitled add for
5 litter dry matter. Is this where you add back the 10:05AM
6 litter?

7 A Yes.

8 Q And so you're putting litter back in as though
9 it's clean at this point; correct?

10 A Correct. 10:05AM

11 Q What is your calculation to get the amount of
12 litter that's in the house?

13 A I think in broilers, I think we used 24
14 percent, but I have that number there somewhere,
15 also gotten out of one of those books. 10:05AM

16 Q What is -- what is the calculation or source
17 of data used for the amount of tons of litter that
18 are in the house?

19 A Well, we used the percentage figure of the
20 litter that was organic, and that number was -- 10:05AM
21 there's one in the Agricultural Waste Management
22 Handbook, as well as there's other sources.

23 Q And then the next column says, converted to
24 litter dry matter. Explain to me what that means.

25 A Well, the total litter with dry matter is at 10:05AM

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1 that point, yes, but then we added 25 percent
2 moisture back because that's the way it's harvested.

3 Q And you add the -- is that the next column
4 where you add it back?

5 A Yes. 10:06AM

6 Q Adjusted to removal?

7 A Yes.

8 Q So you're adding back the 24 percent moisture?

9 A Right.

10 Q Correct? 10:06AM

11 A Correct.

12 Q All right.

13 A Actually it's -- the moisture is different
14 from that. We used the moisture at -- for layers
15 was 20.3, for broilers was 31 and for turkeys -- 10:06AM

16 where's that -- excuse me -- 50 for layers, 24 and
17 34. That's right below, and so we used -- in the
18 case of layers, we used the wet litter system,
19 meaning it's put on the concrete and scraped off.

20 Q Okay, and then the next column is your less 10:07AM
21 transported. We talked yesterday about the 70,000
22 tons --

23 A Yes.

24 Q -- that you say were transported in 2007;
25 correct? 10:07AM

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1 A Yes.

2 Q And then the last column is what you conclude
3 is a net for application, that is, that was the
4 amount that will go out of the barn and be land
5 applied; is that the way I understand? 10:07AM

6 A Be available for land application.

7 Q What is the moisture content of the net for
8 application in this calculation?

9 A Well, it's around 25 percent but it -- but for
10 the -- because the layer is in there, it would be a 10:08AM
11 little higher than that for the total. For the
12 broiler, it's around 25 percent. For the layer,
13 it's higher.

14 Q Go down to the next row where you have the
15 layer, broilers and turkeys listed there. 10:08AM

16 A Uh-huh, yes.

17 Q Under dry basis, what is the 75 percent number
18 that you're using this?

19 A 75 percent is that that's how much water is in
20 it. 10:08AM

21 Q All right, and the source of that
22 documentation is what?

23 A We looked at that yesterday. You gave me a
24 document and showed that across the board, and that
25 was in I think ag waste characteristics. 25 percent 10:08AM

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1 was the dry basis for the solids.

2 Q Tell the court, if you would, please, in the
3 next column there that you, I think, have a listing
4 for the broilers of 31.17 percent. Is that what you
5 referred to as a delay factor?

10:09AM

6 A Correct.

7 Q And is that what we've been talking about this
8 delay factor, that additional drying that is
9 occurring based upon the manure by itself?

10 A Drying and loss of components.

10:09AM

11 Q Okay, and so you've reduced that to a ratio or
12 a percentage over time; is that what that is?

13 A Correct.

14 Q And is this for -- are these calculations for
15 a single flock?

10:09AM

16 A No. It would be for a house.

17 Q And how many flocks would have been in on this
18 period of time?

19 A We used five.

20 Q Let's go down to the next block of numbers
21 where it says actual numbers.

10:09AM

22 A Yes.

23 Q And the poultry litter as removed, you have
24 manure tons. Is the manure tons there actual manure
25 or is it litter?

10:10AM

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1 A If you'll notice in parenthesis over to the
2 left, it says litter.

3 Q All right. That's my point. The column says
4 manure, but in fact this is litter from poultry?

5 A In the case for all of the rest of them, it's 10:10AM
6 manure, and in the case of poultry, it is litter
7 because we're focusing on what is available to be
8 put on or is put on the watershed or on the land.

9 Q What was your source again for how much clean
10 litter is put into a barn? 10:10AM

11 A Well, it's more than one source, but there is
12 a statement there. In the case of ag waste
13 characteristics, they talk about 10 tons, but in my
14 communication with folks that put litter in houses,
15 it ranges from 10 to 15 tons. So it's -- and they 10:11AM
16 say more commonly 15 tons, and then every time they
17 decake, they put -- they put in another 5 tons.

18 Q Okay. Let's look at the column phosphorus
19 where we have the -- both areas we have poultry
20 litter as removed up above in the actual numbers. 10:11AM
21 That says 6.2 million phosphorus. Do you see that?

22 A No. Just a minute. Where are we again? Give
23 me --

24 Q We're in the first block of actual numbers.

25 A Okay. 10:11AM

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1 Q Poultry litter removed in the phosphorus
2 column.

3 A Yes, okay.

4 Q 6.2 million?

5 A 6.2 million pounds. 10:11AM

6 Q All right, and go to the next block below it
7 under the same column same heading, and you have a
8 4.7 million pounds of phosphorus, do you not?

9 A Correct.

10 Q Explain to the court the reason for the 10:12AM
11 reduction in the phosphorus occurring in those two
12 instances.

13 A In the first instance, the first table, it
14 shows litter as removed from the houses, and in the
15 second table, it's litter available to be applied. 10:12AM
16 That means litter produced or harvested from the
17 houses minus exported litter.

18 Q So the phosphorus reduction is solely due to
19 exported litter from the 6.2 million to the 4.7
20 million number? 10:12AM

21 A That is correct.

22 Q What, if any, calculation did you make for any
23 waste being imported to the IRW?

24 A None.

25 Q Did you talk to John Everett to determine 10:12AM

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1 whether or not he knew waste had been imported?

2 A Yes. Well, I didn't talk to John Everett
3 about that, but I talked to others who had indicated
4 that some of it had been moved inside the watershed,
5 but I also did some further review and discovered 10:13AM
6 that there are others out there that export other
7 than Sheri Herron, and one particular individual, a
8 guy by the name of Morton, told me, and he didn't
9 show me his numbers, but he told me, he said I haul
10 about 60,000 tons out of here a year. 10:13AM

11 Q And who is Mr. Morton?

12 A He's a person with D&M Litter Transport.

13 Q And do you know whether or not he participated
14 in the subsidy program?

15 A Said he did not. 10:13AM

16 Q And do you know whether or not some of the
17 waste that he's actually removing is reported
18 through Herron?

19 A He said he didn't have direct line or
20 communication with Herron. 10:14AM

21 Q Do you know whether or not the -- that Morton
22 is actually receiving subsidy through a program
23 monitored by --

24 A I do not.

25 Q And you didn't look at his numbers to know 10:14AM

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1 grown significantly?

2 A That is true.

3 Q And so applications occurring then would have
4 a better chance of protection from the grass
5 strands; would you agree?

10:40AM

6 MR. GRAVES: Object to form.

7 A It would be possible for some portions of that
8 to get protected by grass leaves.

9 Q And we, I think, agreed yesterday, and correct
10 me if I'm wrong, that there's always going to be
11 some moisture content in the soil in the IRW, is
12 there not?

10:41AM

13 A Well, there are times on the surface when it
14 is extremely low. So to answer it literally, yes,
15 you can always extract some moisture out of it, but
16 there are -- there are many times that on the
17 surface when there's not much there.

10:41AM

18 Q Okay, and you would agree that at the time of
19 the application, farmers are trying to time it so
20 that rain comes and does what's necessary to
21 fertilize the grass with poultry waste; correct?

10:41AM

22 A They are interested in the grass growing, and
23 water is a requirement.

24 Q All right. On Page 15 of your report, sir,
25 you criticize the work prepared by Engel and Smith

10:41AM

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1 in the mass balance. Do you recall those
2 statements?

3 A Yes. I think they called it a mass balance,
4 and I said I didn't believe that it was designed as
5 a mass balance. It looked to me like it was 10:42AM
6 designed as a -- as what is produced in the
7 watershed predominantly.

8 Q Is that what you said in your report or is
9 that what you're saying now?

10 A Well, I'm interpreting what I said in the 10:42AM
11 report. I'm not reading it.

12 Q All right. Tell the court, if you would,
13 please, what experience you have with conducting or
14 performing any mass balances.

15 A Well, I've not done many mass balances. 10:42AM

16 Q How many --

17 A But I've read about what the components of
18 mass balances are.

19 Q How many mass balances have you actually
20 operated or performed yourself? 10:42AM

21 A I don't know that I've done any.

22 Q Have you received any specific education or
23 training in the use of performing a mass balance?

24 A Well, personal experience and involvement in
25 the business. 10:43AM

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1 in 1999 reporting 1997 information. They had the
2 53,000. They also reported dairy cows there of
3 2,675, and they did talk about pounds per year of
4 nitrogen and calculated for both beef cattle and
5 dairy cattle, and then if you look in the next
6 column, we had both Oklahoma and Arkansas data for
7 total number of beef cattle as well as milk cows,
8 and in this case we had other cattle which we could
9 add to it.

10:50AM

10 Q And those are based upon the 2002 census
11 materials?

10:50AM

12 A Yes.

13 Q All right.

14 A So then we made a comparator of 1997 data to
15 calculate a watershed number on the very right
16 column using the same percentages from the column to
17 the left, and so then from that, we were able to
18 calculate the -- down below, the pounds of nitrogen
19 that each of the animals would have produced based
20 on our beef cattle numbers and our dairy cattle
21 numbers, and we used the weight, absolute weight of
22 the animals in this case because that's what the
23 weight of the animals was used in the Conservation
24 Commission.

10:50AM

10:51AM

25 Q And that weight is reflected as the beef

10:51AM

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1 mile.

2 Q Okay. Who prepared this map? Let me back up.
3 Who did the calculations that underlie the data that
4 created this map?

5 A We did the calculations, and Tim Sullivan did 10:55AM
6 the map.

7 Q All right. When you say we did the
8 calculation, are you referring to yourself and Dr.
9 Jobes?

10 A Yes. 10:55AM

11 Q And what part of the calculation did you
12 perform?

13 A Well, these are the total cattle density -- I
14 mean, the total cattle numbers per ZIP Code.

15 Q What part of the calculations did you perform 10:55AM
16 in preparing the underlying data that created the
17 map?

18 A Well, I participated in the development of
19 those, and I don't remember specifically which
20 numbers I wrote down. 10:55AM

21 Q Did you operate the computer with a
22 spreadsheet in it in order to crunch the numbers?

23 A Dr. Jobes did that.

24 Q All right, and the data that was used came
25 from the 2002 Ag Census; is that correct? 10:55AM

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1 A That's correct.

2 Q And the category is from sold or inventory?

3 A The category is from the way we calculated it,
4 which included cattle in inventory of both other
5 cattle as well as beef cows. 10:56AM

6 Q Okay. So rather than sold, you're using
7 inventory numbers again; correct?

8 A That is correct.

9 Q All right, and did you rely on -- how did you
10 place them on the map, based upon subwatersheds or 10:56AM
11 ZIP Code?

12 A ZIP Code.

13 Q All right, and you did that for both sides,
14 Arkansas and Oklahoma; correct?

15 A Yes. 10:56AM

16 Q How did you -- were there in your beef cattle
17 numbers any asterisks shown in the census data that
18 would not have been picked up in this calculation?

19 A No.

20 Q So the beef -- in fact, it's true, if you look 10:56AM
21 at that schedule that shows the Ag Census data,
22 there doesn't appear to be any asterisks in the
23 columns under the ZIP Codes for the beef categories,
24 is there?

25 A No. 10:57AM

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1 Q That's a correct statement?

2 A Yes. I thought I was answering it correctly
3 from -- there was no asterisks.

4 Q Yeah. Thank you.

5 A Okay. 10:57AM

6 Q Who made the decision on what order streams to
7 reflect in this map?

8 A That was Tim Sullivan.

9 Q Did you instruct him what to use or did he
10 make that determination himself? 10:57AM

11 A I asked him what order streams he had
12 available.

13 Q Based on this map, Exhibit 47, you would agree
14 that the density of cattle is much greater in the
15 Arkansas side than in the Oklahoma side? 10:58AM

16 A Yes.

17 Q In your errata, you lowered your estimate of
18 manure you say is deposited in the riparian area.
19 Would that not have changed your percentages also
20 for access to the riparian areas? 10:58AM

21 A The number that was lowered was minuscule,
22 from a 57.1 number -- or 58 number to 57.1 or
23 something like that.

24 Q So your answer is that it didn't change the
25 percentage of access to the riparian area number? 10:58AM

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1 Q Okay. At Page 16 of your report at the very
2 top it says -- actually it starts at the bottom. It
3 says, of livestock and wildlife present in the
4 watershed, cattle excrete approximately 50 percent
5 of the phosphorus, and you show the tons, with about
6 44 percent of that placed in or near the ephemeral
7 streams or flowing streams. Where did you get your
8 44 percent number, sir?

11:01AM

9 A It's actually 45 percent with the correction.
10 That came out of the estimate that I -- that I had
11 made here that we talked about in Appendix F.

11:01AM

12 Q All right. When you talk of Dr. Storm's
13 report of 231,000 tons of poultry litter, did you
14 actually read his report?

15 A Yes.

11:01AM

16 Q And do you know whether he was reporting as-is
17 or removed as the term you like to use or dry
18 weight?

19 A It was --

20 MS. LONGWELL: Object to form.

11:02AM

21 A Excuse me. It was my interpretation that he
22 was talking about -- he was talking about a removed.

23 Q Do you recall whether or not there's a
24 specific citation to whether it was removed or dry
25 weight?

11:02AM

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1 A I don't.

2 Q Do you recall what the source of the material
3 was that he relied on for his litter calculations in
4 that report?

5 A Yes. I believe he did county data. 11:02AM

6 Q Okay, and have you heard of or reviewed a
7 report called Poultry Waste Georgia, 50 Million
8 Dollar Forgotten Crop by Larry Vest about 1993?

9 A You presented that to me earlier, sometime
10 yesterday, yes. 11:02AM

11 Q And do you know whether or not Dr. Storm
12 relied on information contained in that report for
13 his?

14 A He did cite it.

15 Q Okay, and did you review that material that I 11:02AM
16 just talked about, the Georgia report?

17 A I did see it, yes.

18 Q Is it in your considered materials?

19 A Yes, I believe this is it right here.

20 Q Okay. I think I provided that to you. It's 11:03AM
21 not in your considered materials, is it?

22 A Yes, it is in my considered materials.

23 Q Okay. I stand corrected. Looking at Page 17
24 of your report, sir, where you have the tons listed
25 there, and the one that's NRAES132/Clay -- 11:04AM

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